

### **REMARKS**

In the non-final Office Action, dated February 13, 2006, the Examiner rejected claims 1-23 and 38 under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter; claims 1-9 under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,266,337 (hereinafter "MARCO") in view of U.S. Patent No. 6,870,849 (hereinafter "CALLON"); claims 10-13, 15, 17 and 18 under 35 U.S.C. § 102(e) as allegedly being anticipated by MARCO; claims 14 and 23 as allegedly being unpatentable under U.S.C. § 103(a) over MARCO in view of U.S. Patent No. 6,947,442 (hereinafter "SATO"); claim 16 as allegedly being unpatentable over MARCO in view of U.S. Patent No. 6,519,264 (hereinafter "CARR"); claims 24-27, 29, 31 and 32 as allegedly being unpatentable over MARCO in view of U.S. Patent No. 6,804,237 (hereinafter "LUO"); claim 30 as allegedly being unpatentable over MARCO in view of LUO and further in view of CARR; claim 37 as allegedly being unpatentable over MARCO in view of LUO and further in view of SATO.

Applicants note with appreciation the Examiner's indication of allowable subject matter in claims 19-22 and 33-36.

By way of this amendment, Applicants have amended claims 1, 6 and 10 to improve form. Applicants have also canceled claim 38 without prejudice or disclaimer, and added new claims 39 and 40. No new matter has been added by the present amendment. Claims 1-37, 39 and 40 are currently pending in the application.

Reconsideration of the outstanding rejection of pending claims 1-37 is respectfully requested in view of the amendments above and the following remarks.

**REJECTION UNDER 35 U.S.C. §101**

In paragraph 1, the Office Action rejects pending claims 1-23 under 35 U.S.C. §101 as allegedly being directed to non-statutory subject matter. Specifically, the Office Action asserts that each of independent claims 1, 6 and 10 “does not yield a useful, tangible and concrete result.” The Office Action further asserts that these claims merely manipulate data and do not have a practical application. Applicants respectfully traverse and submit that amended claims 1-23 are directed to statutory subject matter.

For purposes of a 35 U.S.C. § 101 analysis, a claim qualifies as statutory subject matter when it involves a “practical application within the technological arts.” AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 1358 (Fed. Cir. 1999). A claim is limited to a practical application when the process, apparatus or system, as claimed, “produces a concrete, tangible and useful result.” Id. In determining whether a claim is for a “practical application,” the “focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result achieved by the claims invention is ‘useful, tangible and concrete’.” Interim Guidelines For Examination of Patent Applications for Patent Subject Matter Eligibility, 1300 OG 142, § IV. C. 2. b., November 22, 2005. Applicants respectfully submit that the final result achieved by each of amended claims 1, 6 and 10 is “useful, tangible and concrete” and, thus, does involve a “practical application within the technological arts.”

**A. “Useful Result”**

For a result to be “useful,” it has to be 1) specific, 2) substantial and 3) credible. Id. at § IV. C. 2. b. (1). Applicants respectfully submit that the rejected claims achieve a “useful result.” Amended claim 1, for example, recites a method that includes “computing a signature of the router’s network address,” “receiving a packet at the router,” “zeroing out selected fields in the received packet,” “computing a signature of the received packet using the computed signature of the router’s network address” and “using the signature in determining a point of ingress for the packet when it entered a network.” Claim 1, thus, recites the specific result of “computing a signature of the received packet...” and “using the signature in determining a point of ingress for the packet when it entered a network.” This result achieved by amended claim 1 is both substantial and credible. Additionally, amended claim 6 recites the specific result “archiving the one or more computed second signatures in a memory device” and “providing the archived one or more computed second signatures to an agent for tracing a path that a given packet traversed in a network.” Furthermore, amended claim 10 recites “archiving the one or more signature vectors in a second memory” and “providing the archived one or more signature vectors to an agent for determining a point of ingress for the packet when it entered the network.” These results achieved by amended claims 6 and 10 are both substantial and credible. Thus, under the criteria set forth in the PTO’s Interim Guidelines For Examination of Patent Applications for Patent Subject Matter

Eligibility, 1300 OG 142, § IV. C. 2. b (1), Applicants submit that the results achieved by claims 1, 6 and 10 are “useful.”

**B. “Tangible Result”**

To achieve a “tangible result,” a claim must produce a “real-world result” that has a “beneficial result or effect.” Id. at § IV. C. 2. b (2). The “tangible” requirement “does not necessarily mean that a claim must either be tied to a particular machine or apparatus or must operate to change articles or materials to a different state or thing.” Id. Applicants submit that the process recited in amended claim 1 beneficially computes a signature of a received packet and uses the signature in determining a point of ingress for the packet when it entered a network. This beneficial result achieved by amended claim 1 represents a “real-world result” that is useful in tracing a packet that traverses a network. Applicants, therefore, submit that the result achieved by amended claim 1 is a beneficial, real-world result. The rationale set forth by Applicants above regarding “tangible result” applies similarly to claims 2-23.

**C. “Concrete Result”**

To achieve a “concrete result,” a process “must have a result that can be substantially repeatable or the process must substantially produce the same result again.” Id. at § IV. C. 2. b (3). As is apparent from Applicants’ specification, the process recited in claim 1, for example, represents a process that can use computed packets’ signatures for determining a point of ingress for packets when they enter a network. It would be apparent to one skilled in the art that the various aspects of the invention, as recited in claims 1-23 and disclosed in Applicants’ specification, may be repeated to produce

substantially the same result again and again. Therefore, Applicants submit that claims 1-23 achieve a “concrete result.”

**REJECTION UNDER 35 U.S.C. §102**

On page 3, the Office Action rejects pending claims 10-13, 15, 17 and 18 under 35 U.S.C. § 102(e) as allegedly being anticipated by MARCO. Applicants respectfully traverse.

Amended independent claim 10, for example, recites a method that includes “receiving packets at the node,” “computing one or more signatures for each of the received packets,” “aggregating the computed one or more signatures in a first memory to produce one or more signature vectors,” “archiving the one or more signature vectors in a second memory” and “providing the archived one or more signature vectors to an agent for determining a point of ingress for the packet when it entered the network.”

A proper rejection under 35 U.S.C. § 102 requires that a single reference teach every aspect of the claimed invention. See M.P.E.P. § 2131. MARCO does not disclose or suggest the combination of features recited in Applicants’ amended claim 1. For example, MARCO does not disclose or suggest “aggregating the computed one or more signatures in a first memory to produce one or more signature vectors,” “archiving the one or more signature vectors in a second memory” or “providing the archived one or more signature vectors to an agent for determining a point of ingress for the packet when it entered the network,” as recited in amended claim 10. The Office Action relies on column 4, lines 19-21 and column 4, lines 37-39 as allegedly disclosing the subject

matter recited in claim 1. Applicants traverse and submit that these sections of MARCO do not suggest or disclose the above-noted features of amended claim 10.

At column 4, lines 19-21, MARCO discloses:

At block 102, the processor 46 receives an IP packet from the interface 44. Next, a CRC generator 50 computes the checksum of the packet (block 104). The checksum is generated, for example, using standard 32 bit cyclic redundancy checking ("CRC-32").

This section of MARCO, thus, merely discloses the generation of a checksum of a received packet. This section of MARCO does not suggest or disclose "aggregating the computed one or more signatures in a first memory to produce one or more signature vectors," "archiving the one or more signature vectors in a second memory" or "providing the archived one or more signature vectors to an agent for determining a point of ingress for the packet when it entered the network," as recited in amended claim 10.

At column 4, lines 37-39, MARCO discloses:

In addition, the packet routing controller 58 causes a copy of the checksum and a pointer to the packet data to be stored in the hash table 54. At block 112, the packet routing controller 58 causes the original packet to be routed to a network output interface 48.

This section of MARCO merely discloses the storage of a copy of a checksum generated for a received packet and in a hash table 54. This section of MARCO does not suggest or disclose "aggregating the computed one or more signatures in a first memory to produce one or more signature vectors," "archiving the one or more signature vectors in a second memory" or "providing the archived one or more signature vectors to an agent for determining a point of ingress for the packet when it entered the network," as recited in amended claim 10.

Since MARCO does not disclose each and every feature of amended claim 10, MARCO cannot anticipate claim 10. Withdrawal of the rejection of claim 10 under 35 U.S.C. § 102(e) is, therefore, respectfully requested.

Claims 11-13, 15, 17 and 18 depend from claim 10 and, therefore, patentably distinguish over MARCO for at least the reasons set forth above with respect to claim 10.

#### **REJECTIONS UNDER 35 U.S.C. §103**

In paragraph 1, the Office Action rejects claims 1-9 under U.S.C. § 103(a) as allegedly being unpatentable over MARCO in view of CALLON. Applicants respectfully traverse and submit that the Office Action has failed to establish a *prima facie* case of obviousness.

As one requirement for establishing a *prima facie* case of obviousness, the reference (or references when combined) cited by the Office Action must teach or suggest all of the claim features. *In re Vaeck*, 947 F.2d 488, U.S.P.Q.2d 1438 (Fed. Cir. 1991). See M.P.E.P. § 2143. Applicants submit that MARCO and CALLON do not suggest or disclose all of the claim features of amended claim 1.

Amended independent claim 1 recites a method that includes “computing a signature of the router’s network address,” “receiving a packet at the router,” “zeroing out selected fields in the received packet,” “computing a signature of the received packet using the computed signature of the router’s network address” and “using the signature in determining a point of ingress for the packet when it entered a network.”

In rejecting claim 1, the Office Action cites to column 4, lines 19-27 of MARCO as allegedly disclosing “receiving a packet” and “zeroing out the selected fields and computing the signature of the received packet.” The Office Action further cites to column 5, lines 39-48, 53-56 and column 6, lines 44-49 of CALLON as allegedly disclosing “computing a signature of the router’s network address.” Applicants submit, however, that MARCO and CALLON do not suggest or disclose each and every feature of amended claim 1. For example, neither MARCO nor CALLON suggest or disclose “using the signature in determining a point of ingress for the packet when it entered a network”, as recited in amended claim 1.

At column 4, lines 19-27, MARCO discloses:

At block 102, the processor 46 receives an IP packet from the interface 44. Next, a CRC generator 50 computes the checksum of the packet (block 104). The checksum is generated, for example, using standard 32 bit cyclic redundancy checking ("CRC-32"). However, the checksum calculated here excludes the packet header fields that are likely to be different in a packet that was retransmitted. Excluded fields may include, for example, the identifier and the time-to-live fields.

This section of MARCO merely discloses the receipt of a packet and the generation of a checksum for the packet. This section of MARCO does not suggest or disclose “using the signature in determining a point of ingress for the packet when it entered a network,” as recited in amended claim 1.

At column 5, lines 39-48, CALLON discloses:

Instead, the hashing operation of the invention operates on both specific fields in the data packet and an additional input value that is unique to each router. For example, the additional input value can be a single constant value configured in each router, or can be a portion, e.g., the low-order bits, of the IP address of the router. Hence, in one embodiment, the



hashing operation can be performed on the source ID and destination ID of the packet being transferred and the IP address of the router. The hash operation produces a result that is unique to each router, even though the operation is performed for the same packet.

This section of CALLON merely discloses a hashing operation being performed on the source ID and destination ID of a packet being handled by a router, and the hashing operation also being performed on the IP address of the router. This section of CALLON does not suggest or disclose “using the signature in determining a point of ingress for the packet when it entered a network,” as recited in amended claim 1.

At column 5, lines 53-56, CALLON discloses:

In one embodiment, the particular hash operation performed at each node is a cyclic redundancy check (CRC) which includes the additional unique node-identifying input value.

This section of CALLON merely discloses the performance of a hash operation upon a node identifying value obtained from a received packet. This section of CALLON does not suggest or disclose “using the signature in determining a point of ingress for the packet when it entered a network,” as recited in amended claim 1.

At column 6, lines 44-49, CALLON discloses:

Hence, the node-specific value is used in this case as an initial value for the CRC result which is updated as the calculation proceeds. Once again, because the node-specific value is used in the CRC computation, the hash produces a different result at each node for the same data packet.

This section of CALLON merely discloses the use of the node identifying value (i.e., the “node specific value”) as an input to the CRC computation, thus, producing a different hash value at each different node for a same packet. This section of

CALLON, however, does not suggest or disclose “using the signature in determining a point of ingress for the packet when it entered a network,” as recited in amended claim 1.

Since MARCO and CALLON do not suggest or disclose each and every feature of amended claim 1, the Office Action has failed to establish a *prima facie* case of obviousness. Withdrawal of the rejection of claim 1 under U.S.C. § 103(a) is, therefore, respectfully requested.

Claims 2-5 depend from claim 1. Withdrawal of the rejection of these claims is requested for at least the reasons set forth with respect to claim 1 above.

Amended independent claim 6 recites a method that includes “receiving packets at a plurality of the nodes in the network,” “computing first signatures of the network addresses of each of the plurality of nodes,” “computing one or more second signatures for each of the received packets using the computed first signatures,” “archiving the one or more computed second signatures in a memory device” and “providing the archived one or more computed second signatures to an agent for tracing a path that a given packet traversed in a network.” The Office Action cites to similar sections of MARCO and CALLON discussed above with respect to claim 1. Similar to the discussion set forth above, these sections of MARCO and CALLON do not suggest or disclose, among other features, “providing the archived one or more computed second signatures to an agent for tracing a path that a given packet traversed in a network,” as recited in amended claim 6. Withdrawal of the rejection of claim 6 is, therefore, respectfully requested.

Claims 7-9 depend from claim 6. Withdrawal of the rejection of these claims is requested for at least the reasons set forth above with respect to claim 6.

In paragraph 3, the Office Action rejects claims 14 and 23 under U.S.C. § 103(a) as allegedly being unpatentable over MARCO in view of SATO. The Office Action cites SATO for allegedly disclosing a ring buffer and a DRAM. Applicants submit, however, that the disclosure of SATO does not remedy the deficiencies in the disclosure of MARCO noted above with respect to claim 10, from which claims 14 and 23 depend. Applicants respectfully request the withdrawal of the rejection of claims 14 and 23 for at least the reasons set forth above with respect to claim 10.

In paragraph 4, the Office Action rejects claim 16 under U.S.C. § 103(a) as allegedly being unpatentable over MARCO in view of CARR. The Office Action cites CARR for allegedly disclosing “storing signatures (VC) in the second memory indexed by the collection interval.” Applicants submit, however, that the disclosure of CARR does not remedy the deficiencies in the disclosure of MARCO noted above with respect to claim 10, from which claim 16 depends.

In paragraph 5, the Office Action rejects claims 24-27, 29, 31 and 32 under U.S.C. § 103(a) as allegedly being unpatentable over MARCO in view of LUO. Applicants respectfully traverse.

Independent claim 24 recites, for example, an “apparatus for archiving signatures associated with packets received at a node in a network” that includes “a first memory,” “a second memory,” “a signature tap configured to: receive packets at the node” and “compute one or more signatures for each of the received packets,” “a

multiplexer configured to: aggregate the computed one or more signatures in the first memory to produce one or more signature vectors; and “a controller configured to: archive the one or more signature vectors in the second memory.”

In rejecting claim 24, the Office Action (pg. 8) cites to column 4, lines 37-39 of MARCO as allegedly disclosing “a first and second memory” and column 4, lines 21-22 as allegedly disclosing computing “one or more signatures for each of the received packets.” The Office Action (pg. 8) further cites to column 2, lines 8-10 and column 4, lines 37-39 of LUO as allegedly disclosing a multiplexer that can “multiplex/aggregate computed signatures stored in first memory into one signature vector to be archived in the second memory.”

At column 4, lines 21-22, MARCO discloses:

Next, a CRC generator 50 computes the checksum of the packet (block 104). The checksum is generated, for example, using standard 32 bit cyclic redundancy checking ("CRC-32").

This section of MARCO merely discloses the computation of a checksum of a received IP packet. This section does not disclose, or even suggest, “a multiplexer configured to: aggregate the computed one or more signatures in the first memory to produce one or more signature vectors” or “a controller configured to: archive the one or more signature vectors in the second memory,” as recited in claim 24.

At column 4, lines 37-39, MARCO discloses:

In addition, the packet routing controller 58 causes a copy of the checksum and a pointer to the packet data to be stored in the hash table 54. At block 112, the packet routing controller 58 causes the original packet to be routed to a network output interface 48.

This section of MARCO merely discloses the storage of a copy of the computed checksum and a pointer to the associated packet data in hash table 54. In conjunction with the citation to this section of MARCO, the Office Action alleges that MARCO discloses a first “memory holding the calculated checksum” that is “different from the hash table memory.” Applicants note that MARCO discloses that a computed checksum may be stored in a hash table 54. MARCO does not disclose, or even suggest, the aggregation of computed signatures for packets in a first memory to produce signature vectors and the archival of the signature vectors in a second memory, as recited in claim 24. This section of MARCO does not disclose, or even suggest, “a multiplexer configured to: aggregate the computed one or more signatures *in the first memory* to produce one or more signature vectors” or “a controller configured to: archive the one or more signature vectors *in the second memory*,” as recited in claim 24

At column 2, lines 8-27, LUO discloses:

Accordingly, an improved method of multiplexing data within packets, and a protocol making use of such a method are desirable.

In accordance with the present invention, payload associated with multiple packets is multiplexed into a single multiplexed packet. Each payload portion is identified by a mini-header within the multiplexed packet. Advantageously, mapping information is also be transferred as part of such multiplexed packets which include multiplexed payload data. Preferably, the mapping information is used to form mapping tables within routers at edges of access networks. The mapping tables may be used to establish a relationship between mini-headers and full headers. The mapping tables may be used to multiplex data from packets to form a multiplexed packet at an ingress router, and demultiplex the multiplexed packet at an egress router. Conveniently, neither gateways nor out of band signalling are required.

This section of LUO merely discloses the multiplexing of packet payloads associated with multiple different packets into a single packet. Contrary to the allegations of the Office Action, this section has nothing to do with the aggregation of one or more signatures computed for packets in a memory to produce one or more signature vectors, as recited in claim 24.

At column 4, lines 37-39, LUO discloses:

Access routers "A" and "B" 14 and 16 may, for example, be conventional Nortel Networks Passport<sup>TM</sup> switches/routers adapted to function in manners exemplary of the present invention.

This section of LUO merely discloses that the routers of LUO include Nortel switches/routers. This section of LUO has nothing to do with the aggregation of one or more signatures computed for packets in a memory to produce one or more signature vectors, as recited in claim 24.

Thus, as discussed above, MARCO and LUO do not suggest or disclose the combination of features recited in claim 24. Withdrawal of the rejection of this claim under 35 U.S.C. 103(a) is, therefore, respectfully requested.

Claims 25-27, 29, 31 and 32 depend from claim 24. Withdrawal of the rejection of these claims is, therefore, requested for at least the reasons set forth above with respect to claim 24.

In paragraph 6, the Office Action rejects claim 28 under U.S.C. § 103(a) as allegedly being unpatentable over MARCO in view of LUO and further in view of SATO. Claim 28 depends from claim 24, which has been amended to incorporate the

subject matter of claim 33, indicated by the Office Action as being allowable.

Withdrawal of the rejection of claim 28 is, therefore, respectfully requested.

In paragraph 7, the Office Action rejects claim 30 under U.S.C. § 103(a) as allegedly being unpatentable over MARCO in view of LUO and further in view of CARR. Claim 30 depends from claim 24, which has been amended to incorporate the subject matter of claim 33, indicated by the Office Action as being allowable.

Withdrawal of the rejection of claim 30 is, therefore, respectfully requested.

In paragraph 8, the Office Action rejects claim 37 under U.S.C. § 103(a) as allegedly being unpatentable over MARCO in view of LUO and further in view of SATO. Claim 37 depends from claim 24, which has been amended to incorporate the subject matter of claim 33, indicated by the Office Action as being allowable.

Withdrawal of the rejection of claim 37 is, therefore, respectfully requested.

New claim 39 recites a system that includes “a first memory,” “a second memory,” “one or more signature taps configured to: receive packets at the node, and compute one or more signatures for each of the received packets” “a multiplexer configured to: use each of the one or more signatures as addresses for addressing bit locations in the first memory, set memory bits in the addresses of the first memory corresponding to each of the one or more signatures” and “a controller configured to archive a signature vector comprising a block of memory bits from the first memory in the second memory.” Applicants submit that the references cited by the Office Action, either singly or in any reasonable combination, do not suggest or disclose the features recited in new claim 39.

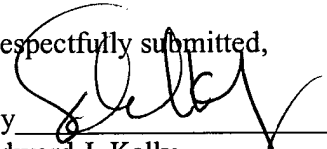
New claim 40 recites a system that includes “a first memory,” “a second memory,” “a signature tap to determine at least one signature for each packet of a plurality of received packets,” “a multiplexer to store, over a collection interval, the determined at least one signature packet for each of the plurality of received packets in the first memory to produce a signature vector that comprises a block of a plurality of signatures for at least a portion of the plurality of received packets” and “a controller configured to archive the one or more signature vectors in the second memory after an expiration of the collection interval.” Applicants submit that the references cited by the Office Action, either singly or in any reasonable combination, do not suggest or disclose the features recited in new claim 40.



In view of the foregoing amendments and remarks, Applicants respectfully request the Examiner's reconsideration of this application, and the timely allowance of the pending claims. To the extent necessary, a petition for an extension of time under 37 CFR § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 18-1945, under Order No. BBNT-P01-364, and please credit any excess fees to such deposit account.

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Respectfully submitted,

  
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